

ABSTRACT

1 A radio transmission system including many radio transmitters using frequency hopping carriers
2 to intermittently transmit very short messages indicative of status of stimuli associated with the
3 transmitters. The transmitters transmit transmissions independently of a receiver receiving the
4 transmissions and independent of each other. In operation, radio transmitters transmit messages at varying
5 frequencies at time intervals that can be varied as well. The frequency and time intervals are varied
6 according to patterns that can be determined individually for each transmitter. A receiver holds data
7 indicative of the future transmission frequency and time for each transmitter and updates the data based
8 on the time and the content of the received messages. In addition, a simple method is provided to
9 generate a very large number of orthogonal frequency-time hopping sequences that are individual for each
10 transmitter and based on the transmitter ID. The problem of transmission of urgent messages is solved by
11 transmitting urgent transmissions at transmission opportunities having precise time and frequencies that,
12 advantageously, are in relations with the routine transmissions. The problem of power-up
13 synchronization in such system is solved by rapidly transmitting, at transmission opportunities, a
14 sequence of synchronization transmissions that carry information about the time and the frequency of a
15 future routine transmission.